



Moving Medicine through Mathematics

Archimedes Modeling of Stroke Prevention for Diabetic, CVD and Hypertension Patients- Costs, Lives and Disabilities Saved

Don Morris
Vice President, Scientific Product Development and Technology
Archimedes Inc
don.morris@archimedesmodel.com

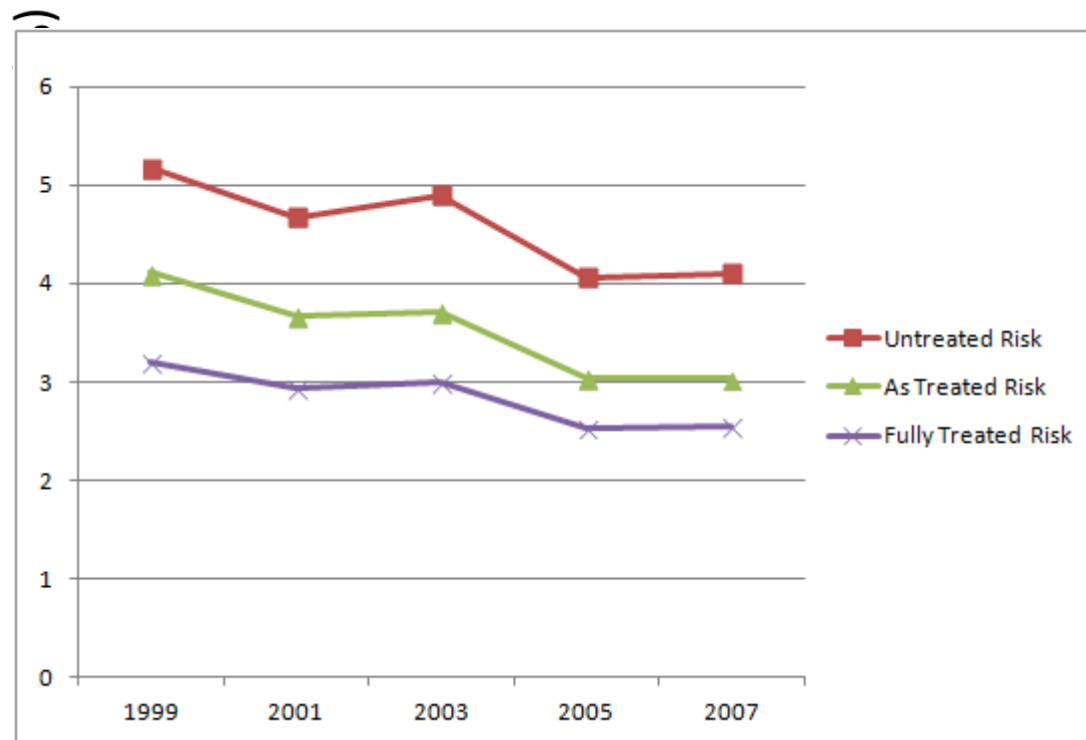
... a KAISER PERMANENTE Innovation

Confidential

 **ARCHIMEDES**
Quantifying Healthcare

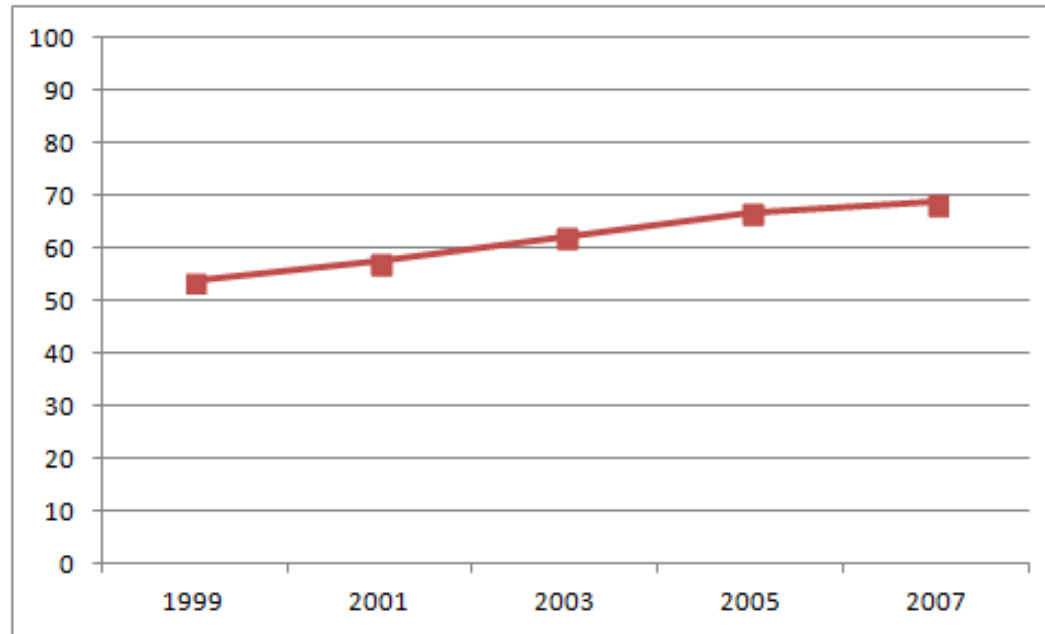
Population Impact of Blood Pressure Treatment on CVD Risk

Average Adult CVD Risk From NHANES
and Blood Pressure Control



Fraction of Potential Prevention Realized

Fraction of CVD Risk Preventable by Blood Pressure Control that is Realized



How can we make our efforts go further?

- Prioritize
- Engage
- Capture the undiagnosed

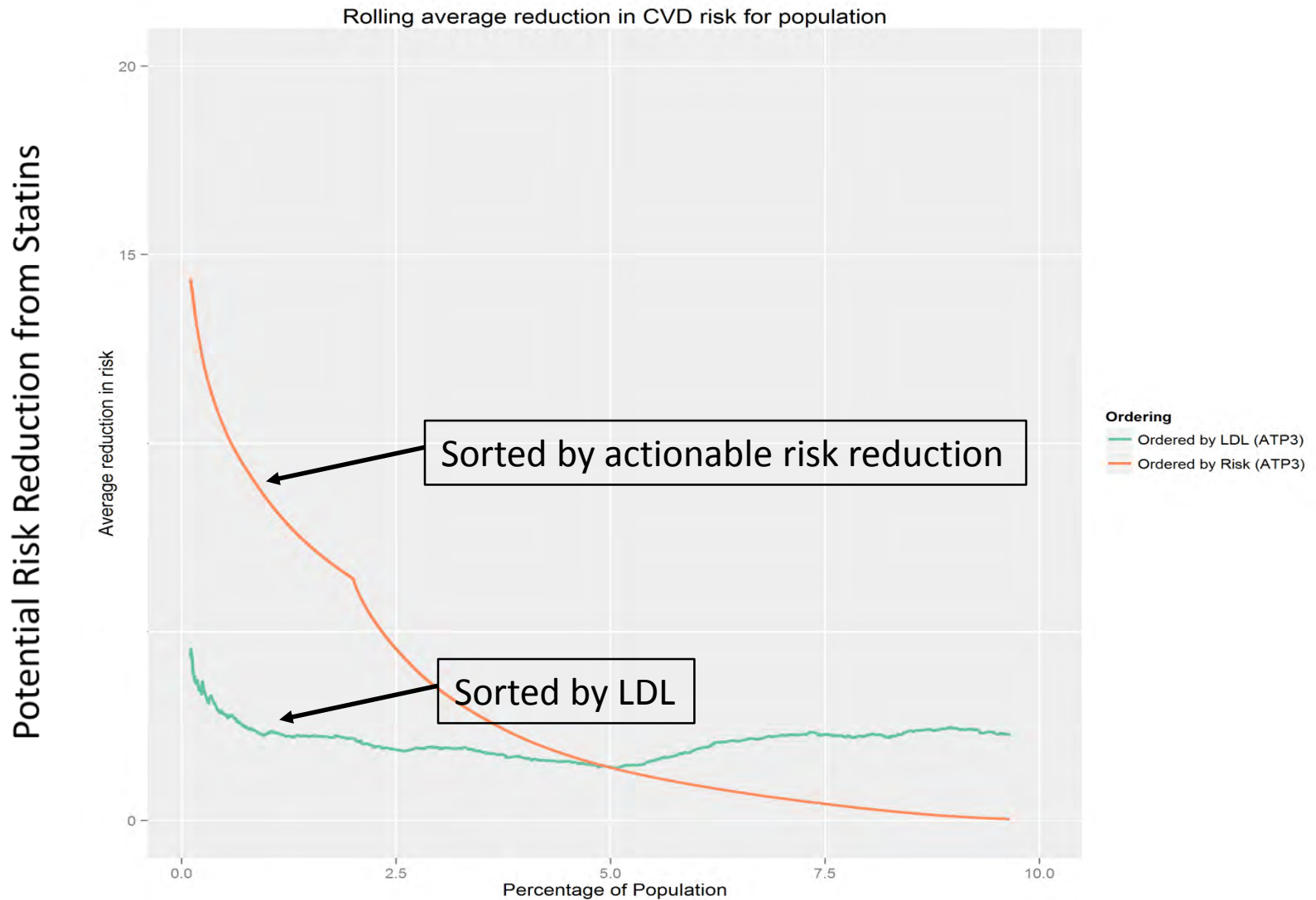
Current Guidelines Pre-date Computers

- Set of siloed and somewhat arbitrary thresholds
- Do not prioritize tasks
- Do not take patient preference into account
- Do not engage patient in his or her care
- Do not address people outside of the system

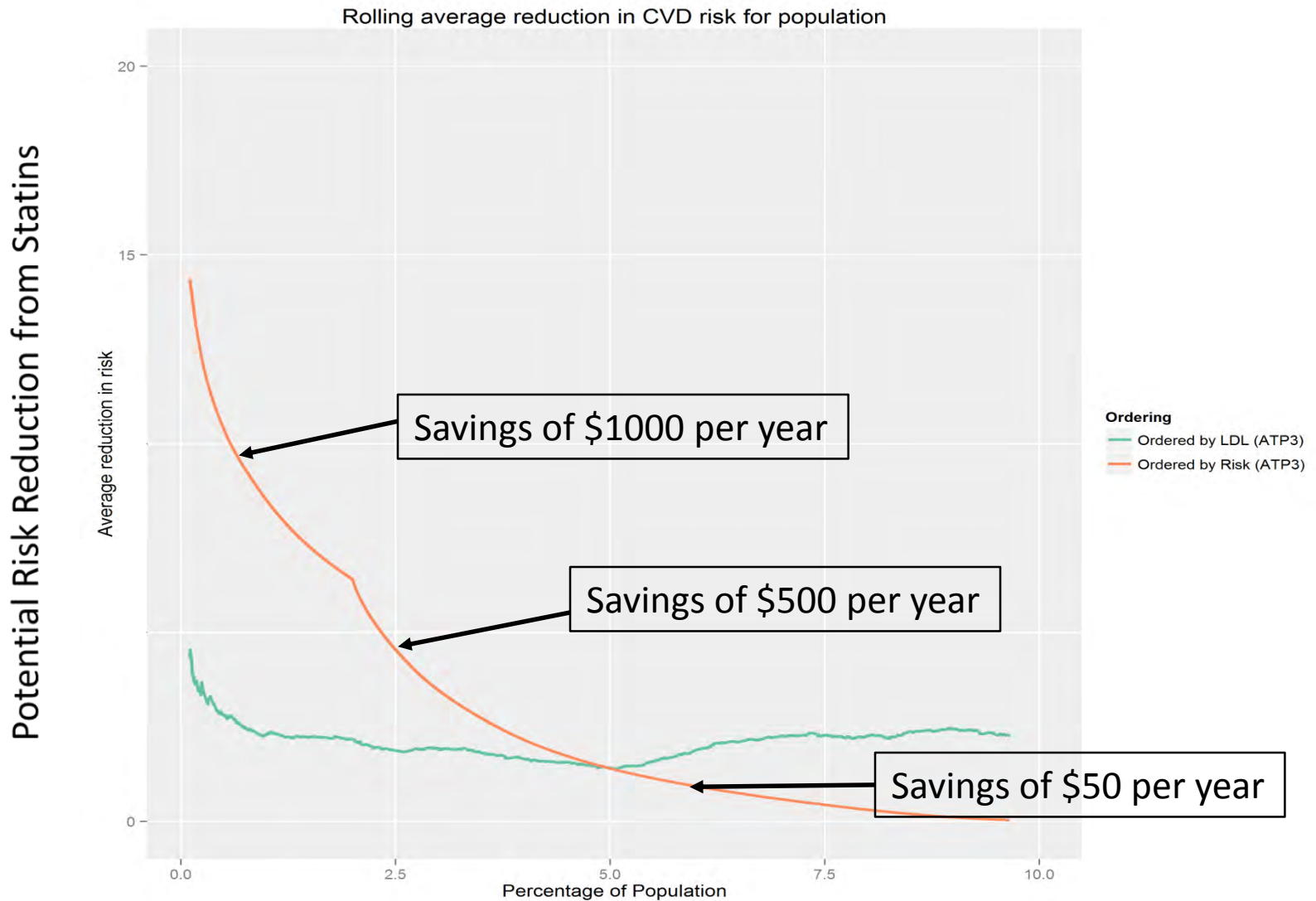
The New World

- New Tools
 - Electronic medical records
 - Better risk models
 - Computers in the exam room
- A New Approach
 - Calculate individual risks
 - Calculate individual impacts of treatment

Prioritize



Prioritize

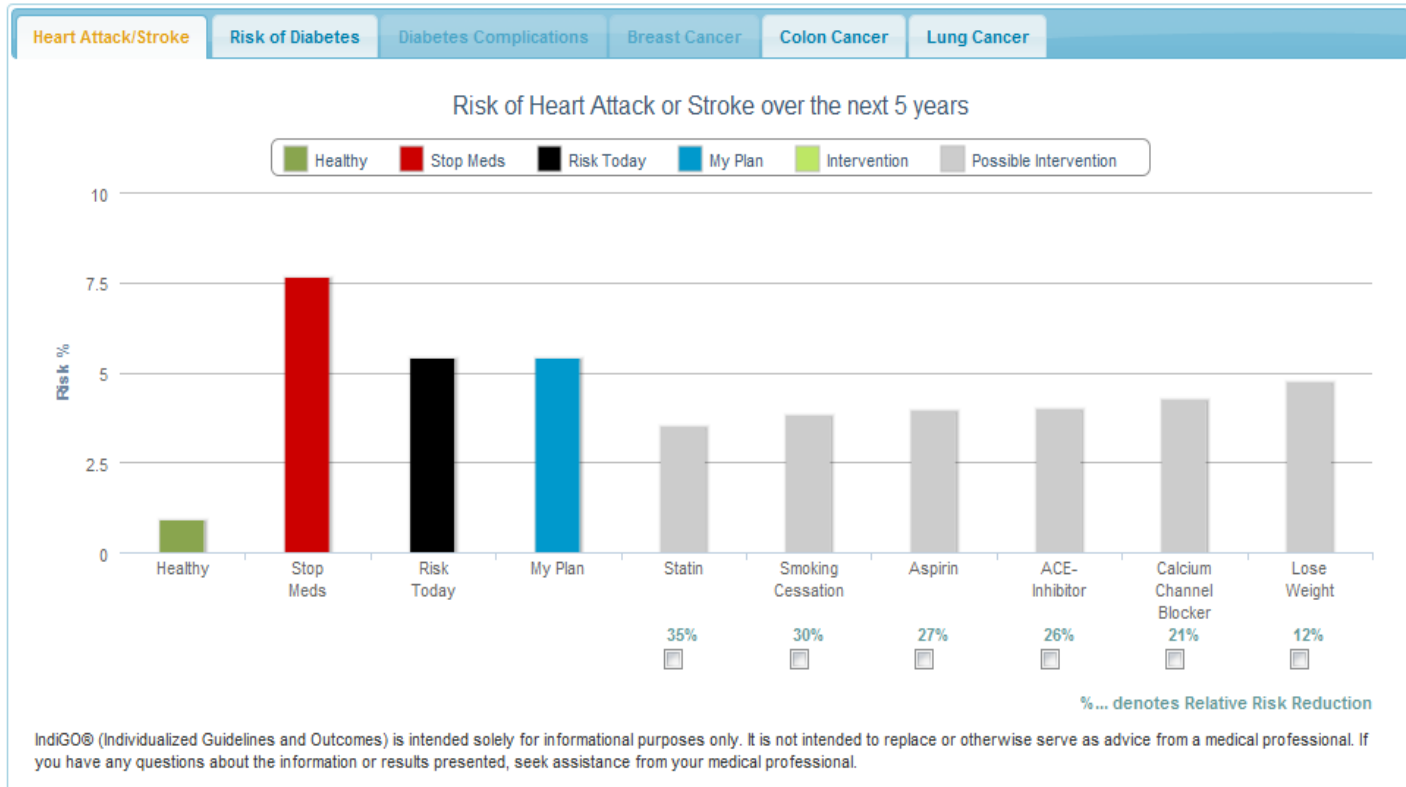


Engage



Printing Options

Aspirin Edit Interventions



Statin Gap Closure without IndiGO:

8%

Statin Gap Closure with IndiGO:

43%

Capture the undiagnosed

- New risk algorithms enable prediction of likelihood of diagnosis and benefit of treatment from whatever information is available
- Use for example to prioritize outreach for lipid testing

Others who benefit from treatment

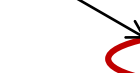
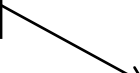
	<u>Mrs. Smith</u>	<u>Mr. Jones</u>
• Age	55	59
• BMI	28	30
• Smoker	no	yes
• Diabetes	yes	no
• History of MI or stroke	no	no
• SBP	150	131
• DBP	86	73
• LDL	187	107
• HDL	36	24
• TC	242	234
• FPG/HbA1c	HbA1c = 8.5	FPG=96
• Currently on hypertension meds	no	no
• Currently on statins	no	no

Existing guidelines would treat only Mrs. Smith

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...But Mr. Jones stands to benefit more

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• Currently on hypertension meds	no	no
• Currently on statins	no	no
• Risk of MI or stroke in 5 years	7.8%	12.4%
• Reduction with lisinopril/hctz/simva	5.2%	8.2%